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DAVID FERRIER:

A BIOGRAPHY.

(Being a Reprint from "Contemporary Medical Men.")

EDITED
BY
JOHN LEYLAND.

Author of "Ancient Buildings in the Parish of Halifax," etc.

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PREFACE.

THIS Biography appeared originally, as a short sketch, in the *Provincial Medical Journal*, and was subsequently included, in an amplified form, in "Contemporary Medical Men," (two volumes, 4to, 1887-8). It is now a third time published, but without further alteration, as an excerpt from the last-named work.

Forest Hill,
July, 1888.

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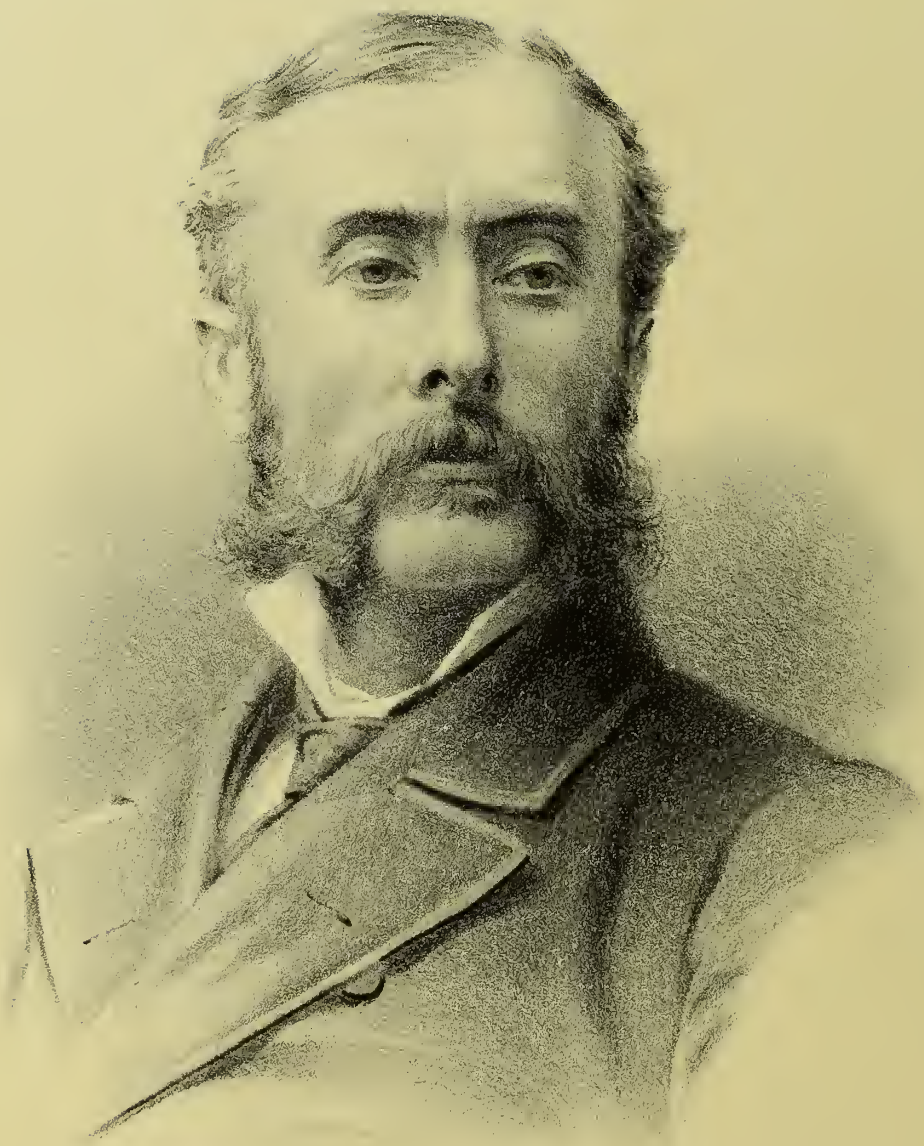

Yours very truly

DAVID FERRIER,

M.A., M.D., F.R.C.P., LL.D., F.R.S.

DR. FERRIER was born in the year 1843, in Aberdeenshire, and received his early education at the Grammar School and Gymnasium, Aberdeen. He entered the University of that city as a student in Arts in 1859, having gained the first place in the competition for bursaries or scholarships. He graduated as Master of Arts in 1863, with double first-class honours in Classics and Philosophy. In the same year he gained the Ferguson Scholarship in Classics and Philosophy, open for competition to graduates of the four Scotch Universities. His tastes at this time lay specially in the direction of Philosophy, in which he was stimulated by the teaching of Professor Bain, and it was his interest in this subject that mainly determined his choice of Medicine as a profession. In 1854 he went to the Heidelberg University, where he prosecuted his psychological studies, and also began the study of Anatomy, Physiology, and Chemistry. In 1865 he commenced his medical studies proper at the University of Edinburgh, where he gained most of the University medals in his various classes, and graduated, with first-class honours, in 1868. After his graduation as M.B., he continued at the University as assistant to Dr. Laycock, Professor of the Practice of Physic, for whose brilliant and speculative intellect he entertained the highest admiration, and on whom he looks back as his most suggestive teacher. Wearied, however, with the drudgery of tutorial work, which absorbed all his time, he next went, in 1869, to act as assistant to Mr. Image, of Bury St. Edmunds, a practitioner of high repute in the eastern counties. There he remained for a year, engaged in congenial practice, and with leisure to prosecute his researches on the comparative anatomy and histology of the brain. Some of the results of these researches he embodied in his thesis on the "Comparative Anatomy of the Corpora Quadrigemina," for which he was awarded the gold medal on his graduation as Doctor of Medicine, in 1870. In the same year Dr. Ferrier came to London in order to assist Dr. Burdon Sanderson in his researches for the medical officer of the Privy Council, and also to lecture on Physiology in the Middlesex Hospital. These appointments, however, he resigned for that of Demonstrator of Physiology in King's College, in 1871.

In the following year Dr. Ferrier was chosen by the Council of King's College to succeed Dr. Guy in the chair of Forensic Medicine—the chair which he now holds.

At this period he intended to devote his attention specially to Forensic Medicine, but the more congenial study of Mental Pathology attracted him, and has since absorbed the greater portion of his time. However, his lectures on Forensic Medicine are greatly esteemed, and have been productive of much good to the students of his class at King's College. His Introductory Lecture on "Poisoning," delivered in 1872, consisted of a very interesting *résumé* of the history of the subject, and was pregnant with practical suggestions. Two years later, on a like occasion, he spoke of "Rational Medicine," urging a claim that therapeutics should be placed upon a rational scientific basis, as contra-distinguished from the position of almost pure empiricism. "Nearly every positive fact in regard to vital function," he said, "has been ascertained by the process of experiment on the lower animals. . . . . . . Why should we not follow the same course in our endeavour to arrive at a true scientific knowledge of the action of drugs on the animal economy? This is the method which the progress of modern research points out as the only one capable of furnishing that accurate knowledge respecting the action of remedies which is too frequently vainly assumed in the names which characterize groups of drugs in our pharmacopœias. . . . . . The true physiological action of the agents we employ for the treatment of disease is absolutely necessary before we can combine a rational treatment with a rational pathology. To determine this we must have recourse to the method of experimentation on the lower animals." Dr. Ferrier's high purpose in all his experiments has not prevented him from incurring the special hatred of, and receiving a copious amount of abuse from, the anti-vivisectors, whose futile attempts to convict him of a transgression of the Cruelty to Animals Act, at Bow-street Police Court, will be fresh in the memory of many readers. In connection with Forensic Medicine it should be mentioned that Professor Ferrier assisted Dr. Guy in preparing the fourth and fifth editions of his well-known "Principles."

Early in his professional career in London Dr. Ferrier came into close and intimate relation with Dr. Hughlings Jackson, in whose advanced and philosophical speculations in cerebral pathology he took a keen and sympathetic interest. With a view mainly to test the accuracy of some of Hughlings Jackson's doctrines on the causation of epileptiform attacks, Dr. Ferrier, in 1873, at the invitation of his friend, Dr. (now Sir James) Crichton Browne, to contribute a paper to the West Riding Lunatic Asylum Reports, began a series of experimental researches on the brain. These led on to further and more extended investigations, which have been continued by him up to the present time.

Professor Ferrier's initial researches were directed, from a practical point of view, to discover the primary local source of mental disturbances, which, it is needless to insist upon, is a knowledge eminently desirable for alienists and cerebral pathologists.

The method of these experiments, which were made chiefly on the brains of monkeys, will be found described by Professor Ferrier in the West Riding Lunatic Asylum Medical Reports (vol. iii., 1873), and the general results were presented to the Royal Society, and are printed in its *Proceedings* and *Transactions.*

The first series of experiments related chiefly to localized lesions of several parts of the hemispheres of the brain, with a view to determine the significance, as regards sensation and motion, of the phenomena caused by electrical irritation ; in the second series (which was described in the Croonian Lecture in 1875), the experiments related to a like object through the ablation or destruction of these localized centres. The general conclusions arrived at from the researches are too interesting to be omitted here. They are as follows :—

(1) Ablation of the frontal regions of the brain which give no reaction to electrical irritation is without effect on the powers of sensation or voluntary motion, but causes marked impairment of intelligence and of the faculty of attentive observation.

(2) Destruction of the grey matter of the convolutions bounding the fissure of Rolando causes paralysis of voluntary motion on the opposite side of the body, sensation remaining unaffected, while lesions circumscribed to special areas in these convolutions, previously localized by the author, cause paralysis of voluntary motion limited to the muscular actions excited by electrical stimulation of the same parts.

(3) Destruction of the angular gyrus (pli courbe) causes blindness of the opposite eye, the other senses and voluntary motion remaining unaffected. This blindness is only of temporary duration, provided the angular gyrus of the other hemisphere remains intact. When both are destroyed, the loss of visual perception is total and permanent.

(4) The effects of electrical stimulation, and the results of destruction of the superior temporo-sphenoidal convolution indicate that this region is the centre of auditory perception.

(5) Destruction of the hippocampus major and hippocampal convolution abolishes the sense of touch on the opposite side of the body.

(6) The sense of smell has its centre in the subiculum cornu ammonis or tip of the uncinate convolution on the same side.

(7) The sense of taste is localized in a region in close anatomical relation to the centre of smell, and is abolished by lesion of the lower part of the temporo-sphenoidal lobe.

(8) Destruction of the optic thalamus causes complete anæsthesia of the opposite side of the body.

(9) Destruction of the occipital lobes produces no effect on the special senses, nor on the powers of voluntary motion, but is followed by a state of depression and refusal of food not to be accounted for by mere constitutional disturbance consequent on the operation. The function of these lobes is regarded as obscure, but considered as being in some way related to the systemic sensations. Their destruction does not abolish the sexual appetite.

(10) After removal both of the frontal and occipital lobes, an animal still retains its faculties of special sense and the powers of voluntary motion.*

In order, however, that the localization of cerebral function might be still further studied, a grant was made to Drs. Ferrier and Yeo by the British Medical Association, and an additional grant to Dr. Ferrier alone by the Royal Society, and these gentlemen were thus enabled to present a finished monograph, with a most valuable array of corroborative facts, to the latter body, in January, 1884. The animals treated were again monkeys, mostly species of macaque, thoroughly narcotized with chloroform, and the operations were carried out under antiseptic precautions. The general conclusions were stated to be that lesions of the occipito-angular region cause affections of vision, without affection of the other sensory faculties or motor powers ; that the auditory centre is situated in the superior temporo-sphenoidal convolution ; that destructive lesions of the cortical areas, irritation of which by electrical stimuli causes definite movements on the opposite side, causes motor paralysis without loss of sensation, limited (monoplegia), or general (hemiplegia), according to the position and extent of the lesion ; that experiments on the frontal lobes show a remarkable absence of physiological symptoms in connexion with the almost entire destruction of the prefrontal regions, or anterior two-thirds of the frontal convolutions ; and that, by destructive lesions confined to the cortex and medullary fibres of the inferior and internal aspect of the temporo-sphenoidal lobe, without implication of the crus cerebri, basal ganglia, or internal capsule, it is possible to cause complete anæsthesia (cutaneous, muscular, and mucous) of the opposite side of the body, without paralysis of voluntary motion.*

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* *Philosophical Transactions of the Royal Society*, part ii., 1875.

The question of the localization of cerebral function, though now established in physiology and clinical medicine, gave rise to much discussion as to the true significance of the results obtained, and many divergent views were expressed. The question was eagerly debated at the International Medical Congress of 1881, when Professor Golz, a champion of the Flourentian system of the unity and indivisibility of the organ of mind, brought with him from Strasburg a dog, in which he had long previously destroyed a large extent of the cortex of both hemispheres, the animal retaining both its volitional control of its muscles and all its sensory faculties. A committee, however, which was appointed, found that the lesions did not affect the whole of the so-called motor regions of the brain of the dog ; and two monkeys were brought, one of which, with the greater portion of the region in the left hemisphere, called motor, destroyed, had remained hemiplegic on the right side since the operation, while the other, whose superior temporo-sphenoidal convolution had been destroyed, was absolutely deaf. Thus the localization of function was held to be established, and will be found set forth in Professor Ferrier's work on "The Localization of Cerebral Disease," and in the recent publications of Charcot and Pitres, De Boyer, Grasset, Nothangel, Exner, and Ross.

Professor Ferrier believes that the localization of function in the brain will be of great practical value in the hands of the cerebral pathologist. "Tested by the standard of practical utility, what," he asked in his address to the Royal Medical and Chirurgical Society, upon the occasion of his receiving the Marshall Hall Prize in 1883, "has cerebral localization done, or is likely to do, towards a more successful treatment of cerebral disease than we yet can boast of?" Already Professor Ferrier believes it has given new precision to clinical and pathological descriptions, has cleared our conceptions as to the significance of numerous symptoms, has rationalized many purely empirical generalizations, and is every day bringing us nearer to what Virchow has termed the goal of modern medicine—viz., the localization of disease. "But," he says, "when this has been reached as regards cerebral disease, when we are able to determine the exact nature and position of the *materies morbi*, is it at all likely that we shall stop here?" Indeed, Professor Ferrier believes that there are now certain signs that we are within measurable distance of the successful surgical treatment of some of the most distressing and otherwise hopeless forms of intercranial disease, an operation which will vie with the splendid achievements of abdominal surgery. Surgical interference, which he has strongly advocated, is now a question of the day, and he gives us hope that the agonizing headache, the torturing sickness, the racking convulsions, the loss of sight, the progressive paralysis, and mental infirmity and miserable death from cerebral tumour, which we daily see and are powerless to avert, will ere long give way to the scalpel of the surgeon. Granting the natural hesitation of physicians to advise surgical operations on the brain, until the principles of diagnosis shall have become established, he asks, "Is there any reason why a surgeon should shrink from opening the cranial cavity, who fearlessly exposes the abdominal viscera?" The peritoneum, he points out, was until a very recent date held sacred and inviolable; and the dura mater and brain are much in the same position now.

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* *Philosophical Transactions of the Royal Society*, part ii., 1884.

But after what Professor Ferrier has seen of the unfailing safety, the freedom from all untoward results as regards health and life, with which the most formidable and repeated operations can be performed on the brain and its coverings, under stringent antiseptic precautions,—and these on animals of the most delicate, almost human, organization,—he cannot but believe that similar results are capable of being achieved on man himself.

Apart from secondary inflammation and its consequences, which can be absolutely prevented, there is no risk to life from even extensive destruction of the cerebral hemispheres. It is true that, in attempts to remove tumours, or locally treat other forms of disease, we may injure or destroy healthy portions of brain tissue. And he asks, "What will follow?"

Not necessarily mental disorders or appreciable mental defect. With the exception of certain functions arrogated by the left hemisphere, we have for mental purposes practically two brains; and diseases are not always on the left side. The records, and our daily experience of disease and injury of the brain, show that considerable portions of brain substance may be destroyed without great danger to mental stability. Paralysis may certainly ensue, more or less extensive, or defects in special sense, according to the position and amount of the lesion. Such risks undoubtedly exist, as well as others incidental to the operation itself, as is the case with all surgical operations.

" But the choice," Professor Ferrier concludes, " is not between this and any other mode of treatment, but between running these risks and certain death."*

He therefore is glad that certain successful cases, by Mr. Horsley, at the Queen Square Hospital, have begun to attract great notice, and believes that, even in ten years more, surgery will be able to boast of many brilliant triumphs in the treatment of the brain—the direct result of physiological examination. He naturally takes some legitimate pride in this great step which he has done so much to promote.

Professor Ferrier's fertile pen has contributed many papers to other questions touching cerebro-spinal disease, not the least important of which are his articles on " Hemisection of the Spinal Cord " and " Cerebral Amblyopia and Hemiopia."

Dr. Ferrier pursues his scientific investigations in the spare hours and holidays he can snatch from his professional work. He practises as a physician, devoting his special attention to diseases of the nervous system.

He was appointed Junior Physician to the West London Hospital in 1872, Assistant Physician to King's College Hospital in 1874, and full Physician in 1880. He also acted as Assistant Physician to the Hospital for Epilepsy and Paralysis, Regent's-park, from 1877 to 1880, when he was appointed Physician to the National Hospital for the Paralyzed and Epileptic. He was elected a Fellow of the Royal Society in 1876, and Fellow of the Royal College of Physicians in 1877. In 1883 his Alma Mater, the University of Aberdeen, conferred on him the honorary distinction of LL.D. He is also a Laureate of the Institute of France, a Corresponding Member of the Clinical Society of Paris and of the Academy of Medicine of Turin, and Marshall Hall Prizeman of 1883. He has likewise held the position of Examiner in Forensic Medicine to the Universities of Edinburgh and London.

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* Marshall Hall Oration, 1883.

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